

Claims

1. A piezoelectric vibration piece, characterized in comprising:

a pair of vibration arms that are formed by a piezoelectric material, and are extending in a horizontal direction from a base section;

a groove with a bottom each provided to the vibration arms, and extending along a length direction of the corresponding vibration arm; and

a support section provided in such a manner so as to across the groove in a width direction to integrally connect the material structuring the vibration arm separated by the groove in the width direction.

2. The piezoelectric vibration piece according to Claim 1, characterized in that an integral section being integrated with the bottom section of the groove of the support section is formed so as to be thicker than at least an end section located on an opening side of the groove of the support section.

3. The piezoelectric vibration piece according to Claim 1 or 2, characterized in that the groove is provided to a surface side and a back side of each of the vibration arms.

4. The piezoelectric vibration piece according to any one of Claims 1 to 3, characterized in that the support section is plurally formed to one of the grooves.

5. The piezoelectric vibration piece according to any one of

Claims 1 to 4, characterized in that each of the vibration arms has the arm width being in a range from 50 μm to 150 μm , and the depth of the groove being 30 percent or more but less than 50 percent of the material thickness of each of the vibration arms.

6. The piezoelectric vibration piece according to any one of Claims 1 to 5, characterized in that the groove width of the groove provided to each of the vibration arms is 40 percent or more of the arm width of the corresponding vibration arm.

7. The piezoelectric vibration piece according to Claims 6, characterized in that the groove width of the groove provided to each of the vibration arms is 70 percent or more of the arm width of the corresponding vibration arm.

8. A piezoelectric device accommodating a piezoelectric vibration piece in a case or a package, characterized in that

the piezoelectric vibration piece comprises:

a pair of vibration arms extending in a horizontal direction from a base section;

a groove with a bottom that is provided to each of the vibration arms, and is extending along a length direction of the corresponding vibration arm; and

a support section provided so as to across the groove in a width direction to integrally connect a material structuring the vibration arm separated by the groove in the width direction.

9. A portable phone unit utilizing a piezoelectric device that is accommodating a piezoelectric vibration piece in a case or a

package, characterized in that

by the piezoelectric device in which the piezoelectric vibration piece comprises:

a pair of vibration arms extending in a horizontal direction from a base section;

a groove with a bottom that is provided to each of the vibration arms, and is extending along a length direction of the corresponding vibration arm; and

a support section provided so as to across the groove in a width direction to integrally connect a material structuring the vibration arm separated by the groove in the width direction, a clock signal for control is derived.

10. Electronic equipment utilizing a piezoelectric device that is accommodating a piezoelectric vibration piece in a case or a package, characterized in that

by the piezoelectric device in which the piezoelectric vibration piece comprises:

a pair of vibration arms extending in a horizontal direction from a base section;

a groove with a bottom that is provided to each of the vibration arms, and is extending along a length direction of the corresponding vibration arm; and

a support section provided so as to across the groove in a width direction to integrally connect a material structuring the vibration arm separated by the groove in the width direction, a clock

signal for control is derived.